AMENDMENTS TO THE CLAIMS

1. (currently amended) A method of performing digital optical communications to transmit an optical signal through an optical fiber, comprising ~~the step of~~:

shaping ~~the~~ a waveform of the optical signal ~~to be~~ being transmitted through the optical fiber ~~to increase~~ by increasing the frequency thereof before the ~~waveform~~ power is stabilized, when the optical signal starts increasing in level at ~~the~~ a time the optical signal is applied to the optical fiber.

2. (currently amended) A semiconductor laser that modulates from a first level to a second level , comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most $\lambda/4$; and

an active layer ~~having~~ including a multiple quantum well structure, having a gain ~~which~~ saturation coefficient of greater than 0, such that said gain is saturated as a carrier concentration in the active layer increases.

3. (original) A semiconductor laser according to claim 2, further comprising a resonator, said phase shift region being disposed nearly centrally in said resonator.

4. (currently amended) A semiconductor laser ~~according to claim 2~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most $\lambda/4$; and

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases,

wherein said active layer ~~has~~ includes a multiple quantum well structure having growth surface irregularities.

5. (currently amended) A semiconductor laser ~~according to claim 3~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most λ/4;

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases; and

a resonator, said phase shift region being disposed nearly centrally in said resonator,

wherein said active layer ~~has~~ includes a multiple quantum well structure having growth surface irregularities.

6. (currently amended) A semiconductor laser ~~according to claim 2~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most λ/4; and

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases,

wherein said active layer ~~has~~ includes a multiple quantum well structure ~~composed of~~ comprising two stage potential quantum wells.

7. (currently amended) A semiconductor laser ~~according to claim 3~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most λ/4;

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases; and

a resonator, said phase shift region being disposed nearly centrally in said resonator,

wherein said active layer ~~has~~ includes a multiple quantum well structure ~~composed of~~ comprising two stage potential quantum wells.

8. (currently amended) A semiconductor laser ~~according to claim 2~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase

shift region disposed therein for achieving a phase shift of at most $\lambda/4$; and

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases,

wherein said active layer ~~has~~ includes a multiple quantum well structure including a non-radiative carrier recombination layer.

9. (currently amended) A semiconductor laser ~~according to claim 3~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most $\lambda/4$;

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases; and

a resonator, said phase shift region being disposed nearly centrally in said resonator,

wherein said active layer ~~has~~ includes a multiple quantum well structure including a non-radiative carrier recombination layer.

10. (currently amended) A semiconductor laser ~~according to claim 2~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most $\lambda/4$; and

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases,

wherein said active layer ~~has~~ includes a multiple quantum well structure which is progressively thicker toward the center of the semiconductor laser in the axial direction of the resonator.

11. (currently amended)A semiconductor laser ~~according to claim 3~~, comprising:

a diffraction grating for effecting distribution feedback, said diffraction grating having a normalized coupling coefficient kL of at least 2.0, said diffraction grating having a phase shift region disposed therein for achieving a phase shift of at most $\lambda/4$;

an active layer including a gain, which is saturated as a carrier concentration in the active layer increases,

active layer increases; and

a resonator, said phase shift region being disposed nearly centrally in said resonator,

wherein said active layer ~~has~~ includes a multiple quantum well structure which is progressively thicker toward the center of the semiconductor laser in the axial direction of the resonator.

12. (original) A digital optical communication system comprising a semiconductor laser according to claim 2 as a communication light source.

end

13. (original) A digital optical communication system comprising a semiconductor laser according to claim 3 as a communication light source.

14. (new) A method of transmitting an optical signal through an optical fiber, comprising:

modulating from a first level to a second level, a semiconductor laser; and

after said modulating, increasing a frequency, f, of a relaxation oscillation, such that, $df/dt > 0$.

15. (new) A method of transmitting an optical signal through an optical fiber, comprising:

modulating, from a first to a second level, a semiconductor laser; and

after said modulating, providing an optical signal with a frequency, f, such that a magnitude of a stabilized state exceeds that of a local stabilized state during said modulating to produce a pulse compression.